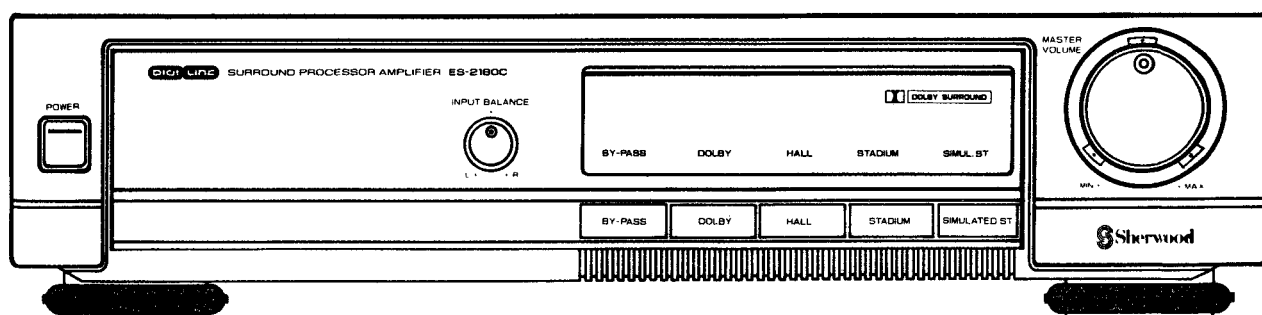


# SERVICE MANUAL

## ES-2180C

### SURROUND PROCESSOR AMPLIFIER



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 **Sherwood**

# Safety Precaution

## WARNING

Service should not be attempted by anyone unfamiliar with the necessary precautions on this player. The following precautions are necessary during servicing.

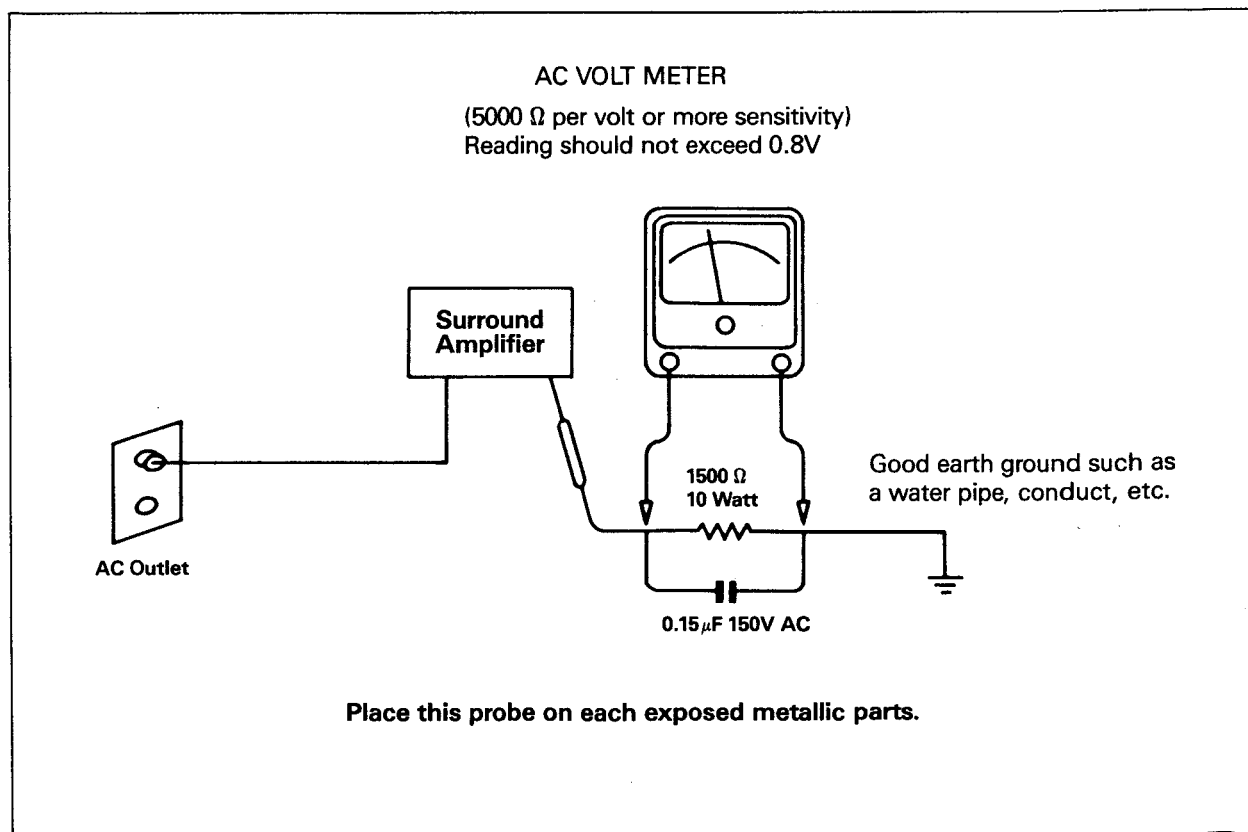
1. Many electrical and mechanical parts in this player have special characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements: electrical components having such features are identified by a  $\triangle$  in the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully.

The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

2. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such

as terminals, screwheads, metal overlays, etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet. (Do not use a line isolation transformer during this check.) Use an AC volt-meter having 5000  $\Omega$  per volt or more sensitivity in the following manner: Connect a 1500  $\Omega$  10 watt resistor paralleled by a 0.15  $\mu$ F, 150V AC capacitor, between a known good earth ground (water pipe, conduct, etc) and the exposed metallic parts, one at a time. Measure The AC voltage across the combination of 1500  $\Omega$  resistor and 0.15  $\mu$ F capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3volts RMS. This corresponds to 0.2mA AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



# Specifications

1. Power Output/ch. min. Continuous average at 1kHz with no more than 0.3% THD into 8 $\Omega$	15W
2. Inter Modulation Distortion (60Hz:7kHz=4:1) at 8 $\Omega$ 15 watts	0.2%
3. Input Sensitivity at 8 $\Omega$ 15 watts 1kHz line in	150mV
4. Damping Factor	50
5. Signal to noise ratio (A network WTD/UNWTD)	
By Pass	92/86dB
Stadium	81/79dB
Hall	61/60dB
*Dolby	61/60dB
Church	64/63dB
Chamber	81/79dB
Synereo	87/85dB

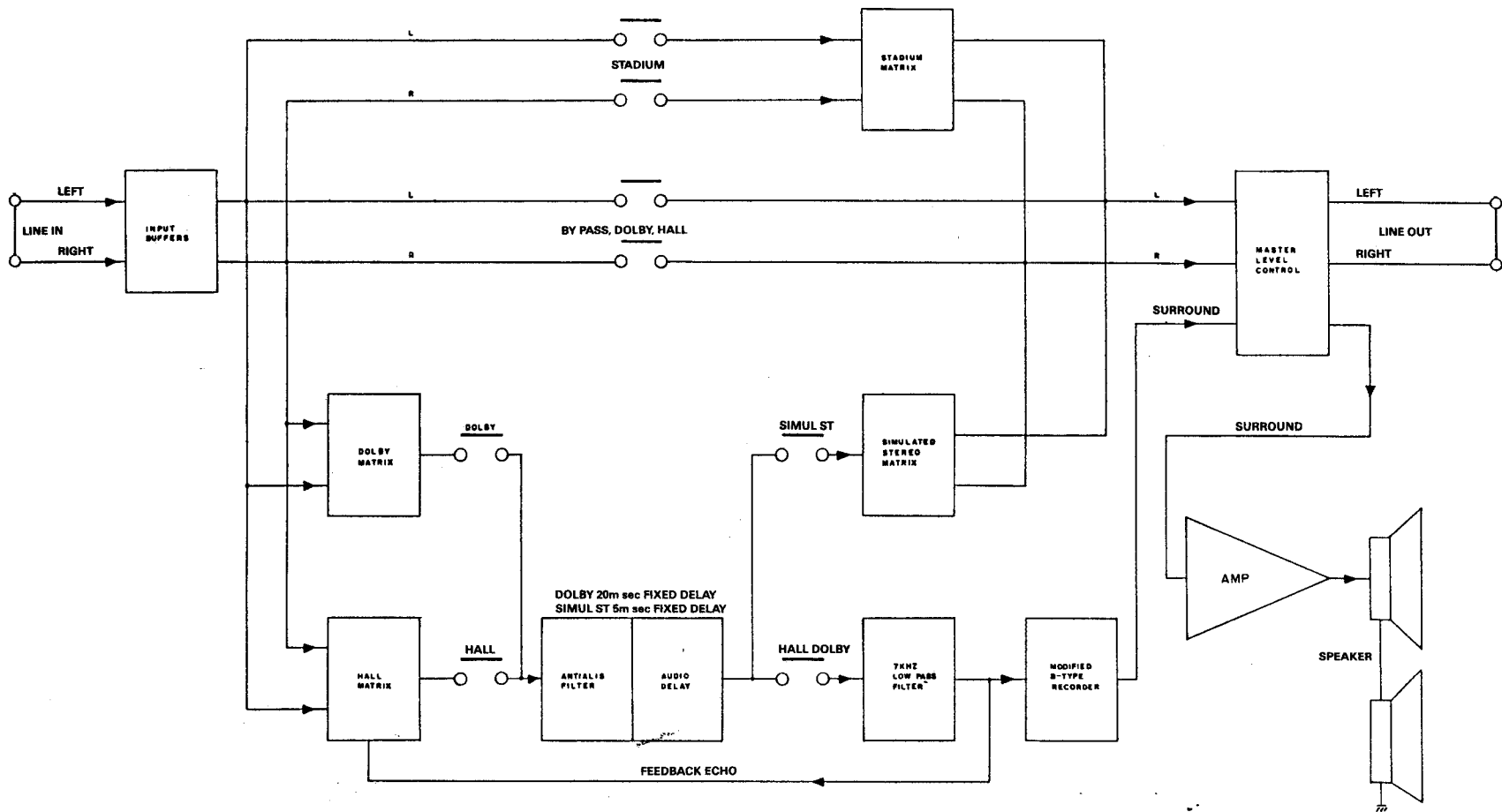
## Others

Power Consumption	50W (min.10W max.75W)
Power Requirements;	
A: 120V 60Hz for American/Canadian version	
B: 120/220V, 60/50Hz for multi-voltage version (switchable)	
C: 220V 50Hz for general European version	
D: 220V 50Hz for Germanian/Italian version	
E: 240V 50Hz for U.K/Austalian version	
F: 220V 50Hz for Swiss/Scandinabian version	
Dimensions	(W)440 $\times$ (H)70 $\times$ (D)245mm (W)17.3 $\times$ (H)2.8 $\times$ (D)9.6 inch
Weight	8 lbs, 12.8 ozs (4.0kg)

**Note:** Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the American (A) standard, and provides information on regional circuit modification through use of alternate schematic or wiring diagrams and information on regional component variations through use of parts list. Design and specifications subject to change without notice for improvement.

\* Dolby Noise Reduction manufactured under licence from Dolby Laboratories Licensing Corporation.

# Block Diagram

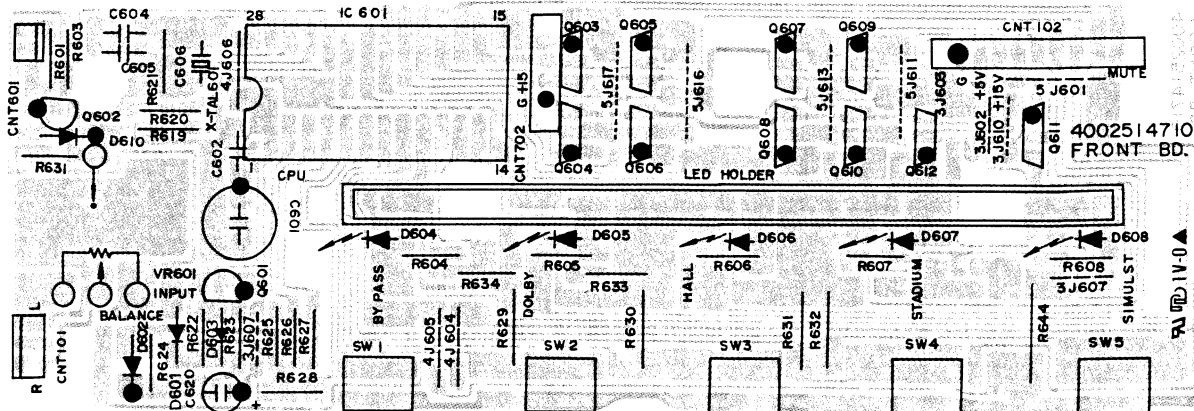


**(TOP VIEW)**



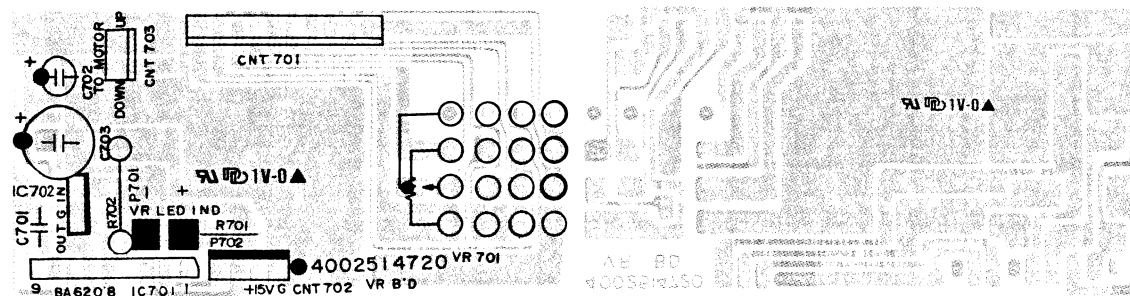
## FRONT P.C. BOARD 4002514710

(TOP VIEW)



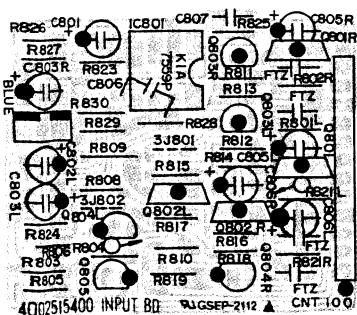
## VOLUME P.C. BOARD 4002514720

(TOP VIEW)

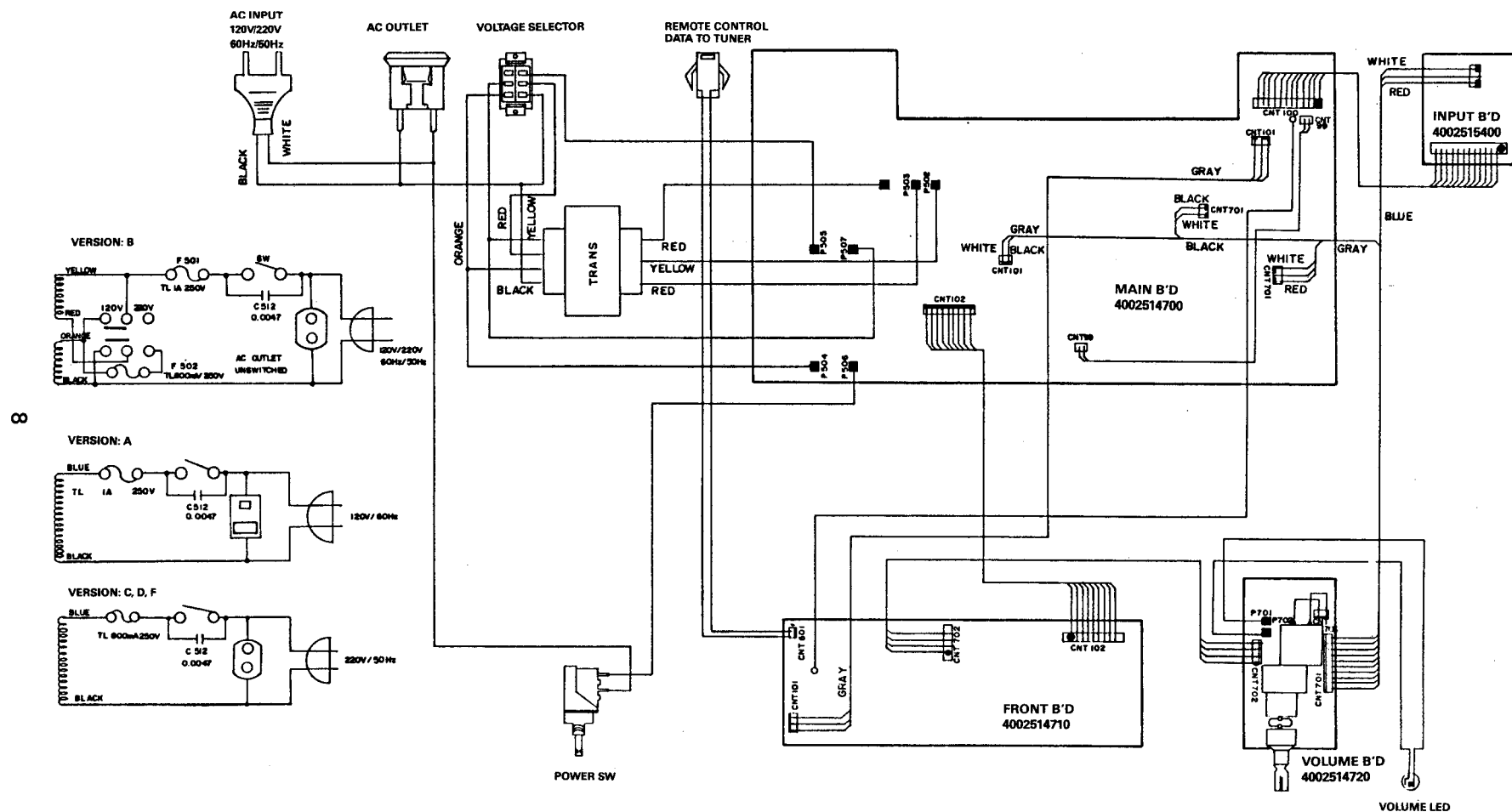


## INPUT P.C. BOARD 4002515400

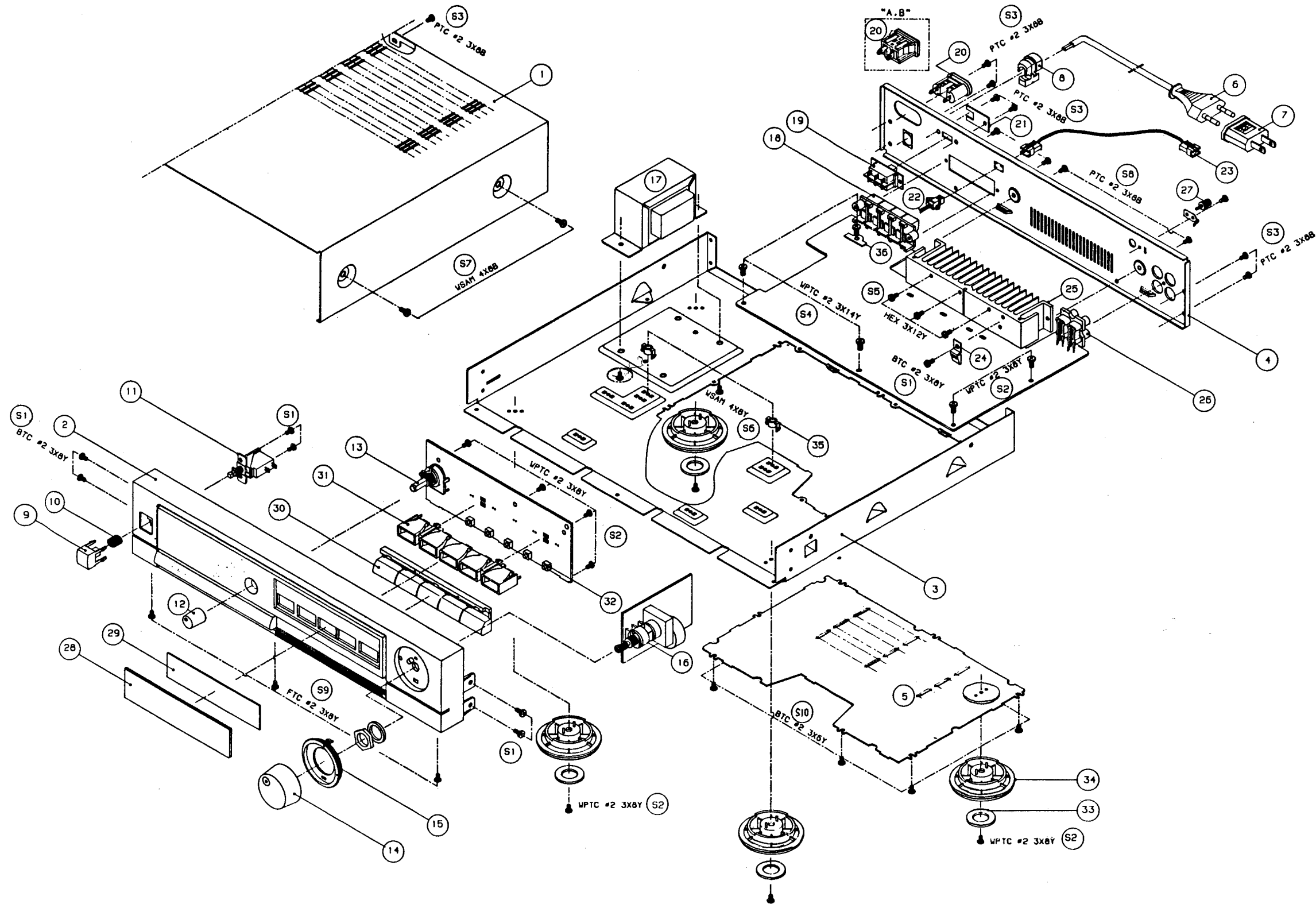
(TOP VIEW)



# Wiring Diagram



### ***Exploded View***





Electrical Parts List

PRODUCT SAFETY NOTICE: Products marked with △ have special characteristics important to safety. If you replace any of these components, carefully read the product safety notice of this manual. Don't degraded the safety of the product through improper servicing.  
Resistors & Capacitors tolerance, D: ±5%, J: ±0.5%, K: ±10%, M: ±20%, Z: +80%, -20%.

Ref. No.	Part No.	Description	Remark
Main Board 4002514700			
Capacitors			
C101L/R	3479210971	Electric SA 1μF 50V M	
C102L/R	3579151130	Ceramic 150pF 50V J	
C103L/R	3579331130	Ceramic 330pF 50V J	
C104L/R	3479222041	Electric SA 22μF 25V M	
C105L/R	3479247971	Electric SA 4.7μF 50V M	
C106/C107	3579470130	Ceramic 47pF 50V J	
C108/C109	3479222041	Electric SA 22μF 25V M	
C110	3579330130	Ceramic 33pF 50V J	
C111	3479222041	Electric SA 22μF 25V M	
C112	3579101130	Ceramic 100pF 50V J	
C113	3479222041	Electric SA 22μF 25V M	
C114	3579101130	Ceramic 100pF 50V J	
C115	3679682120	Mylar 0.0068μF 100V J	
C116	3579103120	Ceramic 0.01μF 50V J	
C117	3579102530	Ceramic 0.001μF 50V Z	
C118	3479210871	Electric SA 0.1μF 50V M	
C119	3479210971	Electric SA 1μF 50V M	
C120	3409222131	Electric SA 220μF 16V M	
C121	3579103120	Ceramic 0.01μF 50V J	
C122	3479247971	Electric SA 4.7μF 50V M	
C123	3579101130	Ceramic 100pF 50V J	
C124	3479210971	Electric SA 1μF 50V M	
C125	3479222041	Electric SA 22μF 25V M	
C126	3679562120	Mylar 0.0056μF 100V J	
C127	3679472120	Mylar 0.0047μF 100V J	
C128	3579471130	Ceramic 470pF 50V J	
C129	3479222041	Electric SA 22μF 25V M	
C130	3479210971	Electric SA 1μF 50V M	
C131	3479247031	Electric SA 47μF 16V M	
C132	3479233871	Electric SA 0.33μF 50V M	
C133	3479210871	Electric SA 0.1μF 50V M	
C134		Not used !	
C135	3579103120	Ceramic 0.01μF 50V J	
C136	3579473530	Ceramic 0.047μF 50V Z	
C137	3679472120	Mylar 0.0047μF 100V J	
C138	3679273120	Mylar 0.27μF 100V J	
C139	3479247041	Electric SA 47μF 25V M	
C140	3579471130	Ceramic 470pF 50V J	
C141/C142	3479210971	Electric SA 1μF 50V M	
C143	3679562120	Mylar 0.0056μF 100V J	
C144	3579471130	Ceramic 470pF 50V J	
C145/C146	3479222041	Electric SA 22μF 25V M	
C183	3579103120	Ceramic 0.01μF 50V J	
C184	3579681130	Ceramic 680pF 50V J	
C201	3479233971	Electric SA 3.3μF 50V M	
C202	3579102530	Ceramic 0.001μF 50V Z	
C203	3579103120	Ceramic 0.01μF 50V J	
C204	3479222041	Electric SA 22μF 25V M	
C205/C207		Not used !	
C206	3579471130	Ceramic 470pF 50V J	
C208/C209	3479233971	Electric SA 3.3μF 50V M	
C210	3479222041	Electric SA 22μF 25V M	
C301	3479210871	Electric SA 0.1μF 50V M	

Ref. No.	Part No.	Description	Remark
C302	3579102530	Ceramic 0.001μF 50V Z	
C303		Not used !	
C304	3409222131	Electric SA 220μF 16V M	
C305	3579680130	Ceramic 68pF 50V J	
C306	3479222041	Electric SA 22μF 25V M	
C307	3579330130	Ceramic 33pF 50V J	
C308/C309	3579101130	Ceramic 100pF 50V J	
C310	3479222041	Electric SA 22μF 25V M	
C311	3479222061	Electric SA 22μF 35V M	
C312	3579473530	Ceramic 0.047μF 50V Z	
C313	3679473120	Mylar 0.047μF 100V J	
C314	3579473530	Ceramic 0.047μF 50V Z	
C315	3479222041	Electric SA 22μF 25V M	
C501/C502	3409210261	Electric SA 1000μF 35V M	
C503/C504	3679473120	Mylar 0.047μF 100V J	
C505/C506	3479210061	Electric SA 10μF 35V M	
C507	3479210121	Electric SA 100μF 10V M	
C508	3409222131	Electric SA 220μF 16V M	
C509	3409222161	Electric SA 220μF 35V M	
C510	3409247041	Electric SA 47μF 25V M	
C511	3479210071	Electric SA 10μF 50V M	
Connector Wafers			
CNT101	4428517610	Plug 3P	
CNT102	4428522910	Plug 9P	
CNT701	4428517510	Plug 2P	
CNT701A	4428517510	Plug 2P	
CNT701D	4428517610	Plug 3P	
CNT99	4119102266	Wire slot 2P 260mm Main to Main	
CNT100	4428525000	L angle type 12P w/Input to Main	
Coil			
L101	2648001010	Inductor 0.5μH	
Diodes			
D101/D102	2508306101	1N4148 Biasing	
D103-D114	2508306101	1N4148 Switching	
D122	2508306101	1N4148 Switching	
D301	2058599109	Zener DZ 15BH	
D501-D504 △	2258106100	1N4002 Rectifier	
D505	2058599104	Zener DZ 5.6BH	
D506	2058599109	Zener DZ 15BH	
D507	2258106100	1N4002 Biasing	
D508	2058599109	Zener DZ 15BH	
D509/D510	2508306101	1N4148 Biasing	
Fuses			
F301	5508402535	FB20 2.5A 250V	
F501	5508302035	TL20 1A 250V	A,B
F502	5508301935	TL20 800mA 250V	B,C,D,F

Ref. No.	Part No.	Description	Remark
ICs			
IC101-IC103	2168206104	KIA 7559P Amplifier	
IC104-IC106	2138017108	LC4966 Switch	
IC107	2168206104	KIA7559 Amplifier	
IC108	2168010103	MN3007 Delay	
IC109	2168010102	MN3101 Oscillator	
IC110	2168206104	KIA7559P Amplifier	
IC111	2168012100	NE646B Noise reduction	
IC501	2168606105	KIA78015 Regulator	
Resistors: All resistors are 1/5W carbon film ± 5% tolerance, unless specified otherwise. M. is metal film, M.O. is metal oxide and C. is cement type.			
R101L/R	3069102970	1kΩ	
R102L/R	3069154970	150kΩ	
R103L/R	3069101970	100Ω	
R104L/R	3069561970	560Ω	
R105L/R		Not used !	
R106-R109	3069273970	27kΩ	
R110	3069101970	100Ω	
R111	3069473970	47kΩ	
R112-R114	3069273970	27kΩ	
R115	3069123970	12kΩ	
R116	3069101970	100Ω	
R117	3069473970	47kΩ	
R118	3069273970	27kΩ	
R121	3069153970	15kΩ	
R122	3069101970	100Ω	
R123	3069473970	47kΩ	
R124	3069563970	56kΩ	
R125	3069273970	27kΩ	
R126	3069563970	56kΩ	
R127	3069153970	15kΩ	
R128	3069101970	100Ω	
R129	3069473970	47kΩ	
R130	3069123970	12kΩ	
R131	3069242970	2.4kΩ	
R132	3069101970	100Ω	
R133	3069522970	5.2kΩ	
R134	3069562970	5.6kΩ	
R135	3069223970	22kΩ	
R136	3069101970	100Ω	
R137/R138	3069154970	150kΩ	
R139/R140	3069562970	5.6kΩ	
R141	3069823970	82kΩ	
R142	3069333970	33kΩ	
R143	3069223970	22kΩ	
R144	3069682970	6.8kΩ	
R145	3069101970	100Ω	
R146/R147	3069822970	8.2kΩ	
R148	3069183970	18kΩ	
R149	3069822970	8.2kΩ	
R150	3069101970	100Ω	
R151	3069472970	4.7kΩ	
R152	3069183970	18kΩ	
R153	3069182970	6.8kΩ	
R154	3069103970	10kΩ	
R155	3069100970	10Ω	
R156	3069102970	1kΩ	
R157	3069184970	180kΩ	
R158	3069274970	270kΩ	

Ref. No.	Part No.	Description	Remark
R159	3069473970	47kΩ	
R160	3069332970	3.3kΩ	
R161	3069102970	1kΩ	
R162	3069683970	68kΩ	
R163	3069203970	20kΩ	
R164	3069333970	33kΩ	
R165	3069203970	20kΩ	
R166	3069181970	180Ω	
R167	3069101970	100Ω	
R168	3069393970	39kΩ	
R169	3069473970	47kΩ	
R170-R175	3069154970	150kΩ	
R176/R177		Not used !	
R178L/R	3069102970	1kΩ	
R179	3069102970	1kΩ	
R181	3069152970	1.5kΩ	
R182	3069105970	1MΩ	
R201	3069104970	100kΩ	
R202	3069183970	18kΩ	
R203	3069822970	8.2kΩ	
R204	3069101970	100Ω	
R205	3069203970	20kΩ	
R206		Not used !	
R207	3069104970	100kΩ	
R208	3069101970	100Ω	
R209/R210	3069473970	47kΩ	
R211/R212	3069561970	560Ω	
R301		Not used !	
R302	3069332970	3.3kΩ	
R303	3069102970	1kΩ	
R304	3069683970	68kΩ	
R305	3069153970	15kΩ	
R306	3069152970	1.5kΩ	
R307	3069102970	1kΩ	
R308	3069683970	68kΩ	
R309	3069102970	M., 1kΩ 1/4W	
R310	3069392970	3.9kΩ	
R311/R312	3069152970	1.5kΩ	
R313	3069392970	3.9kΩ	
R314	3069333970	33kΩ	
R315	3069271970	270Ω	
R316/R317	3059278582	C., 0.27Ω 2W	
R318/R319	3069220970	22Ω	
R501	3039100476	M.O., 10Ω 1W	
R502/R503	3039271476	M.O., 270Ω 1W	
R504	3069152970	1.5kΩ	
R505	3069472970	4.7kΩ	
R506	3069103970	10kΩ	
R507		Not used !	
R508	3069472970	4.7kΩ	
R801	3069102970	1kΩ	
Transistors			
Q301	2208606112	NPN 2SD 1302S Main mute	
Q302/Q303	2008206104	PNP KTA 970BL Diff amplifier	
Q304	2008609102	NPN MPS A06 Biasing	
Q305	2008609102	NPN MPS A06 Voltage driver	
Q306/Q307	2008609102	NPN MPS A06 Predriver	
Q308	2008609102	NPN MPS A06 Switching	
Q309	2028406123	NPN 2SD 2059Y Power amplifier	

Ref. No.	Part No.	Description	Remark
Q310	2028106109	PNP 2SB 1367Y Power amplifier	
Q501	2208206105	NPN KTA 1015Y Muting	
Q502	2008622106	NPN DTC 114Y Muting	
Q503	2008222101	NPN DTC 114Y Muting	
Others			
P501-P507	4225000315	Pin Wrapping	
GND101	4408104910	Plate-Ground	

Front Board 4002514710

Capacitors			
C601	3439147312	Electric SA 0.047μF 5.5V M	
C602	3679103120	Ceramic 0.01μF 50V Z	
C604/C605	3579200130	Ceramic 20pF 50V J	
Connectors			
CNT101	4358503352	Ass'y 3P to Main Board, 350mm	
CNT102	4119109225	Wire Slat 9P to Main Board	
CNT601	4428525080	Ass'y 2P Remote Data to chassis	
CNT702	4119104245	Wire Slat 4P VR Remote to Volume	
Diodes			
D602/D603	2058306101	1N 4148 Biasing	
D610	2058306101	1N 4148 Biasing	
IC601	2138309133	DWP 600A CPU	
LEDs			
D604-D608	2308220326	SLV 56MC3, Function Indicator Green	
Resistors			
R601	3069154970	150kΩ	
R602	.	Not used !	
R603	3069103970	10kΩ	
R604-R608	3069561970	560Ω	
R609-R618	.	Not used !	
R619	3069473970	47kΩ	
R620	3069103970	10kΩ	
R621	3009106273	M. 10MΩ 1/4W	
R622	3069103970	10kΩ	
R623	3069102970	1kΩ	
R624	3069103970	10kΩ	
R625/C632	3069473971	47kΩ	
R633	.	Not used !	
R644	3069473971	47kΩ	
VR601	3208052010	Semi K16MOG 100KEW	
Transistors			
Q601	2208606104	NPN KTC 1815Y Reset	
Q602	2208606104	NPN KTC 1815Y Biasing	
Q603/Q605	2008622106	NPN DTC 114Y Switching	
Q604/Q606	2008222101	PNP DTA 114Y Switching	

Ref. No.	Part No.	Description	Remark
Q607/Q609	2008622106	NPN DTC 114Y Switching	
Q608/Q610	2008222101	PNP DTA 114Y Switching	
Q611	2008622106	NPN DTC 114Y Switching	
Q612	2008222101	PNP DTA 114Y Switching	
Others			
X-TAL601 (Switches)	3908101140	Crystal 40MHz	
SW1	4658002020	Tact, By pass	
SW2	4658002020	Tact, Dolby	
SW3	4658002020	Tact, Hall	
SW4	4658002020	Tact, Stadium	
SW5	4658002020	Tact, Simulated ST	

Volume Board 4002514720

Capacitors			
C701	3579473530	Ceramic 0.01μF 50V Z	
C702	3479210121	Electric SA 100μF 10V M	
C703	3409222131	Electric SA 220μF 16V M	
Connectors			
CNT701	4358510264	Ass'y 10P, Ass'y 2P to Main Board CNT701, Ass'y 2P to Main Board CNT701A, Ass'y 3P to Main Board CNT701D	
CNT702	4428522410	Plug 4P	
CNT703	4358502102	Ass'y 2P to Motor Control	
ICs			
IC701	2168022107	BA6208	
IC702	2168601110	GD7806 Regulator	
Resistors			
R701	3069103970	10kΩ	
R702	3039150476	M.O., 15Ω 1W	
VR701	3208053410	Motor VR EUW-MX 7320A54	
Others			
P701-P702	4225000315	Pin wrapping	

Input Board 4002515400

Capacitors			
C801/C802	3479222041	Electric SA 22μF 25V M	
C803L/R	3479210970	Electric SA 1μF 50V M	
C804	.	Not used !	
C805L/R	3479247971	Electric SA 4.7μF 50V M	
C806	3479247971	Electric SA 4.7μF 50V M	
C807L/R	3579221130	Ceramic 220pF 50V J	
CNT701	4428517610	Connector Plug 3P	
IC			
IC801	2168206104	KIA7559P Amplifier	

Ref. No.	Part No.	Description	Remark
Resistors			
R801	.	Not used !	
R802	3069473970	47kΩ	
R803	3069104970	100kΩ	
R804	3069472970	4.7kΩ	
R805/R806	3069223970	22kΩ	
R807-R810	.	Not used !	
R811-R816	3069105970	1MΩ	
R817-R819	3069472970	4.7kΩ	
R820	3069472970	1MΩ	
R821	3069472970	4.7kΩ	
R822	.	Not used !	

Ref. No	Part No.	Description	Remark
R823/R824	3069101970	100Ω	
R825	3069562970	5.6kΩ	
R826	3069102970	1kΩ	
R827	.	Not used !	
R828	3069562970	5.6kΩ	
R829	3069102970	1kΩ	
R830	3069104970	100kΩ	
Others			
X-FMR	2828072901	Power Transformer	Domestic
	2828075001	Power Transformer for 220V 50Hz	

Note;

A

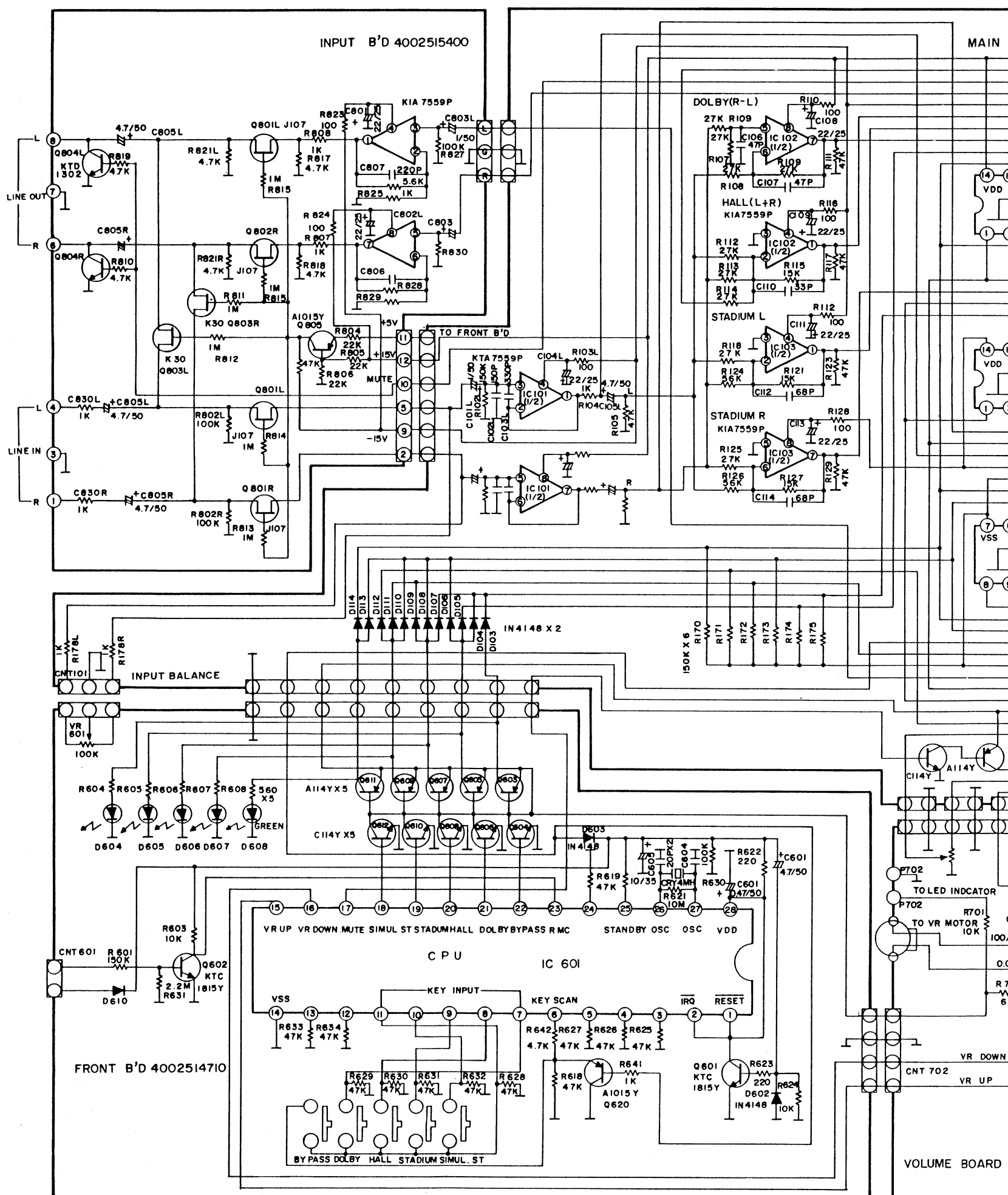
B

C

D

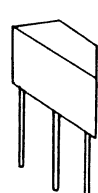
Schematic Diagram

ES2180



S G D

K 30



S G D

J 107



E B C

A06

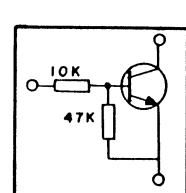
A56



E C B

A114Y

C114Y



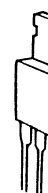
E C B

D1302

A1015Y

C1815Y

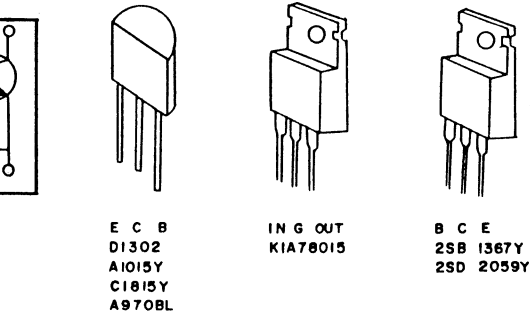
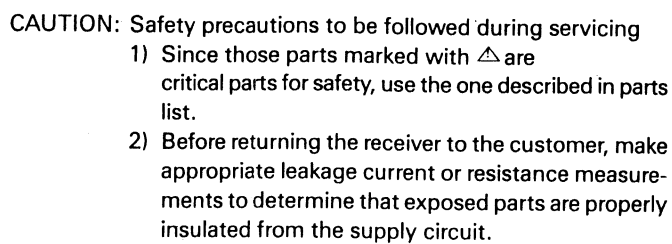
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# ES2180C



# Mechanical Parts List

No.	Description	Part No.	Q'ty	Remark
1	Top Cover, Dark Gray	046122019621	1	
2	Panel Front, Dark Gray	048501016511	1	Domestic
	Panel Front	048501016512	1	
3	Main Chassis	6121604510	1	
4	Chassis Back, Black	046102027811	1	Domestic
	Chassis Back, Black	046102027821	1	A
	Chassis Back, Black	046102027831	1	B
	Chassis Back, Black	046102027841	1	C
	Chassis Back, Black	046102027851	1	D
	Chassis Back, Black	046102027861	1	E
	Chassis Back, Black	046102027871	1	F
5	Bottom Cover	6123406920	1	
6	AC Power Cord, Black	4308000810	1	Domestic
(6)	AC Power Cord, Black	4308003610	1	E
7	AC Adapter, Black	4428300310	1	Domestic
8	Cord Stopper, Black	6513000310	1	Domestic
(8)	Cord Stopper, Black	6518000111	1	E
9	Power Knob, Dark Gray	04854064411	1	
10	Spring Button	65550008710	1	
11	Switch Power	4628044410	1	
12	Knob Rotary, Balance, Dark Gray	048545067211	1	
13	Volume Rotary Balance	3208052010	1	
14	Knob Rotary, Master, Dark Gray	8543024010	1	
15	Decoration Ring, Dark Gray	8523010910	1	
16	Volume Rotary, Main	3208053410	1	
17	Transformer	2828072901	1	Domestic
18	Speaker Terminal	4408103110	1	
19	Voltage Selector, Slide	4618000410	1	Domestic
20	Out Let	4448100410	1	Domestic
(20)	Out Let	4448103110	1	C,D,F
21	Holder Voltage	6515000630	1	Domestic
22	Remocon Connector	4358202350	1	
23	Remocon Connector Ass'y	4355023110	1	
24	Holder Power TR	6515002312	1	
25	Power Heatsink	7503011610	1	
26	RCA Jack, 4P	4438103110	1	
27	Ground Terminal Screw	4408104910	1	Domestic
28	Window LED	048555027811	1	
29	Diffuser	8535015110	1	
30	Knob Tact, 5Key	048543025011	1	
31	Holder LED	6043007910	1	
32	Switch Tact	4658002020	5	
33	Cushion Felt	6725002510	4	
34	Base Foot	046035102111	4	
35	Spacer	6705004220	2	
36	Ground Plate	4235000110	1	
Screws				
S1	#2BTC 3x8 ZNY	8109230081	7	
S2	#2WPTC 3x8 ZNY	8159230081	12	
S3	#2PTC 3x8 ZNB	8119230083	12	
S4	#2WPTC 3x14 ZNY	8159230141	3	
S5	#HEX 3x12 ZNY	8099130121	3	
S6	WSAM 4x8 ZNY	8159440081	2	
S7	WSAM 4x8 ZNB	8159440083	4	
S8	#2FTC 3x8 ZNY	8159230081	3	
S9	#2BTC 3x6 ZNY	8109230061	7	

